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(54) **AUTHENTICATION FOR PRINTING OPERATIONS FROM A CLOUD-BASED SERVER USING A MOBILE DEVICE**

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H04L 29/06 (2006.01)
H04L 29/08 (2006.01)
G06K 7/14 (2006.01)

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(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,095,519	B1 *	8/2006	Stewart	.....	G06F 3/1209	358/1.13
8,584,213	B2	11/2013	Evan et al.			
8,760,679	B2	6/2014	Watanabe			
2005/0052695	A1 *	3/2005	Fukunaga	.....	H04N 1/00132	358/1.15
2007/0279671	A1	12/2007	Shouno			
2010/0110473	A1 *	5/2010	Harrington	.....	G06F 3/1206	358/1.15
2014/0085649	A1 *	3/2014	Hohensee	.....	G06F 3/1298	358/1.13
2015/0074230	A1 *	3/2015	Lee	.....	H04L 67/06	709/219
2016/0239819	A1 *	8/2016	Yamada	.....	G06Q 20/209	
2016/0253127	A1 *	9/2016	Panda	G06F 3/1204	358/1.15

(Continued)

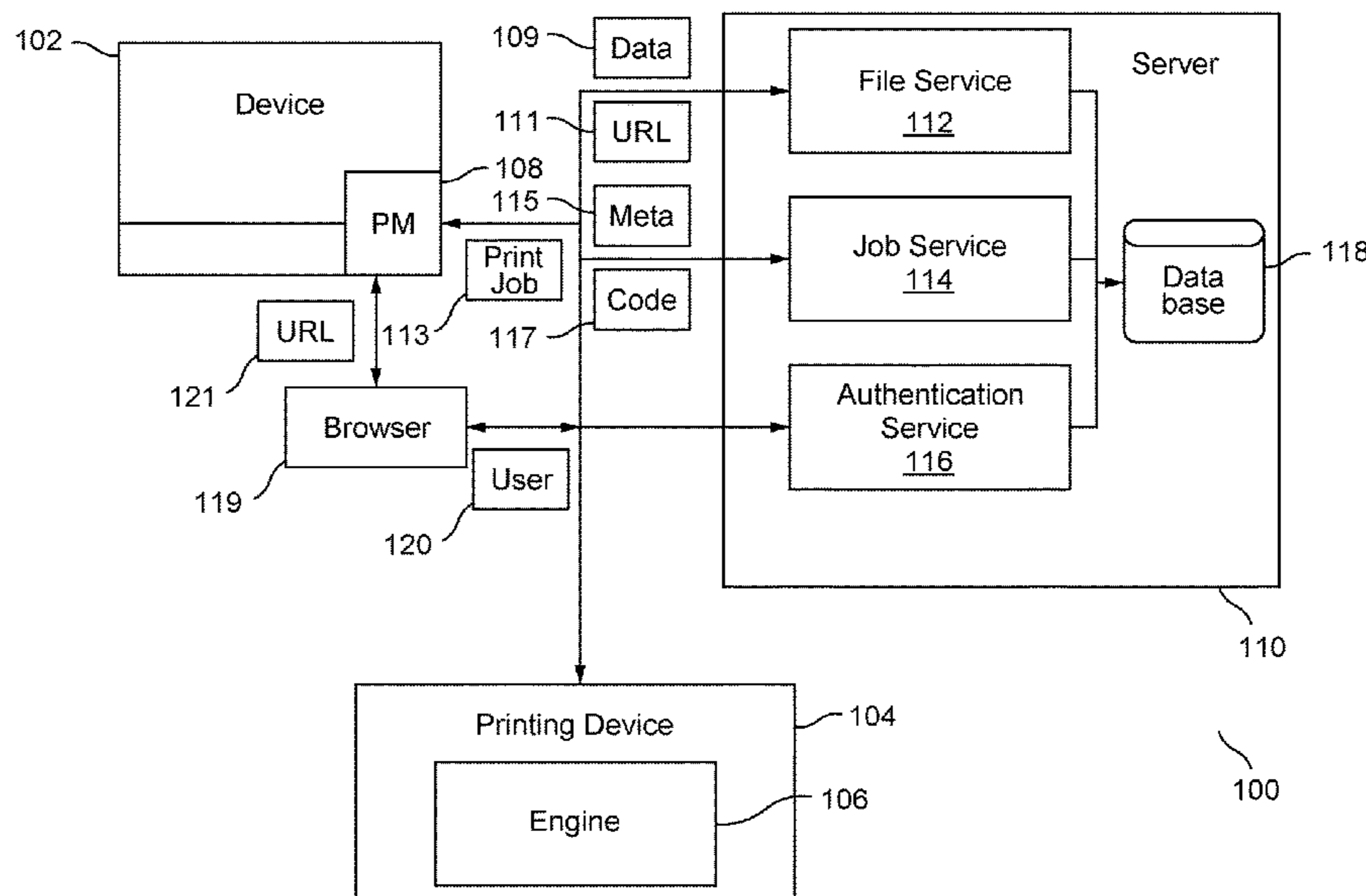
FOREIGN PATENT DOCUMENTS

WO 2011/115987 A2 9/2011
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(57) **ABSTRACT**

A cloud-based server and a port monitor on a device provide authentication of a user to access print jobs on the server. An application may print or perform other operations from the cloud-based server to a printing device. The port monitor uploads data for a document to the cloud-based server. Once the data for the document is uploaded, a claim code is generated by the cloud-based server. The port monitor receives the claim code. The port monitor initiates the launch of a browser having a uniform resource locator (URL) address for the server along with the claim code. The user is authenticated using a login page and the claim code associated to the user to allow access to the document on the server.

16 Claims, 10 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

2017/0257516 A1* 9/2017 Panda H04N 1/32133
2017/0257517 A1* 9/2017 Panda H04N 1/32133
2017/0264616 A1* 9/2017 Maruyama G06F 21/608
2018/0367701 A1* 12/2018 Saito H04N 1/4426

* cited by examiner

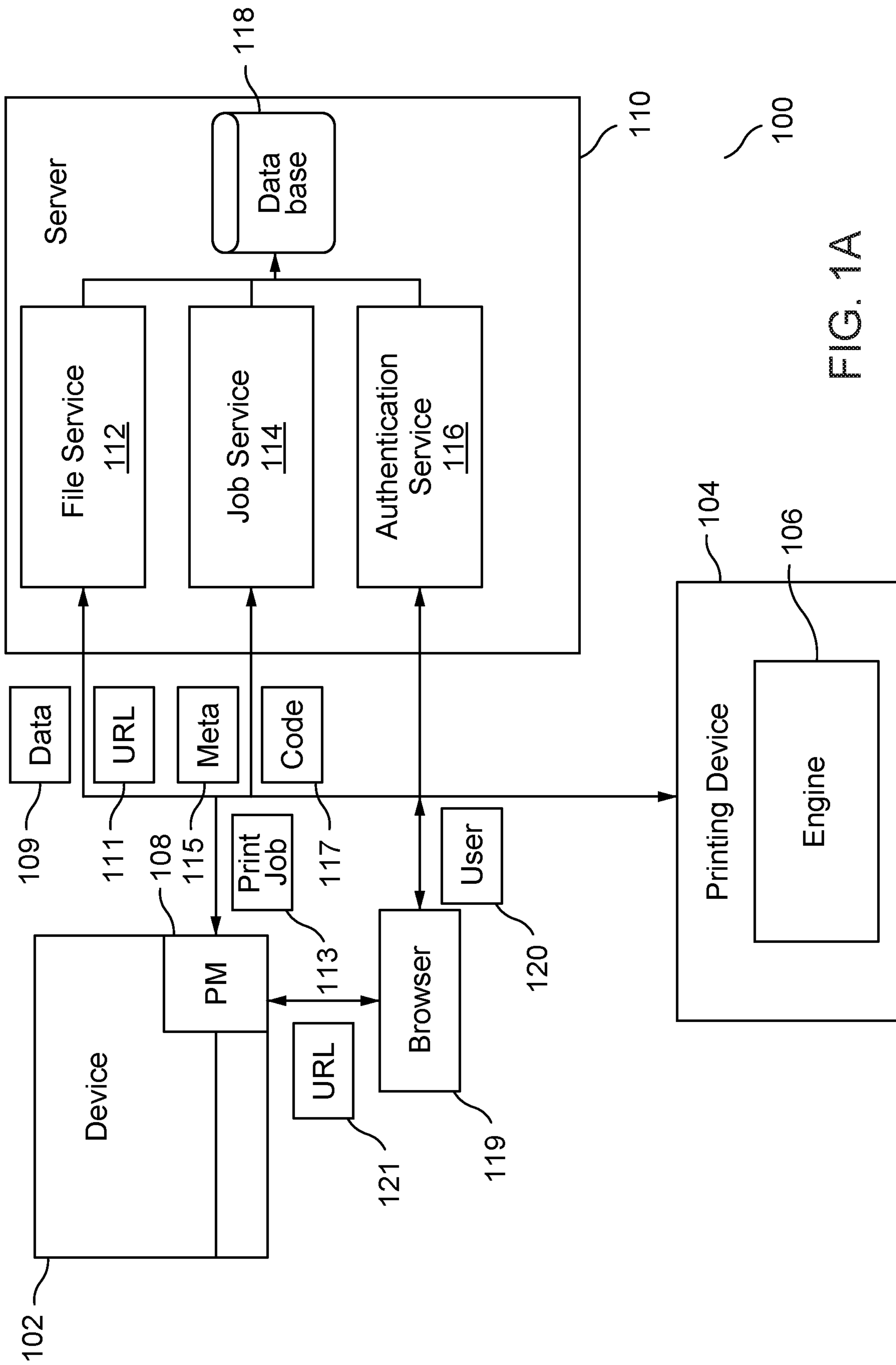


FIG. 1A

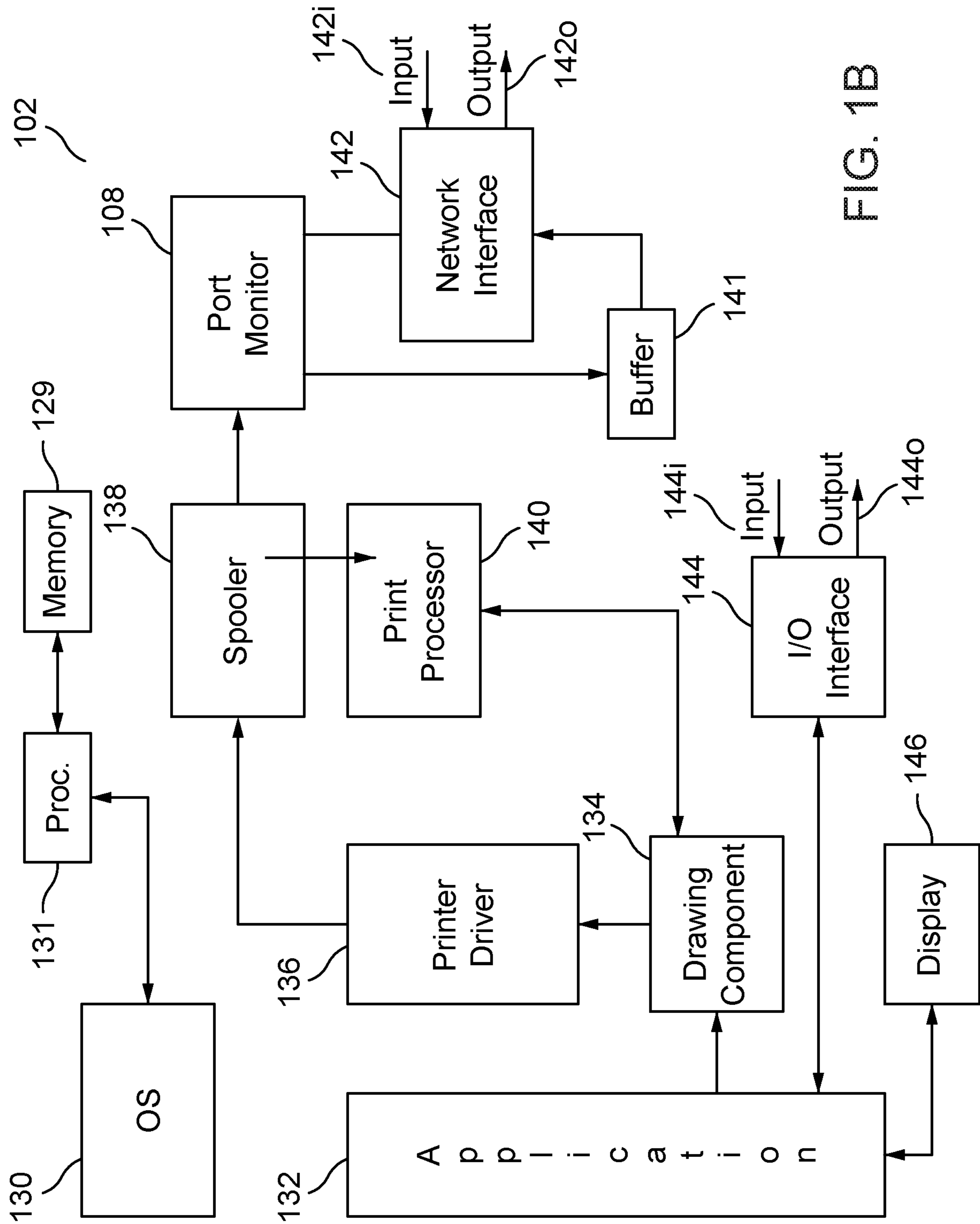


FIG. 1B

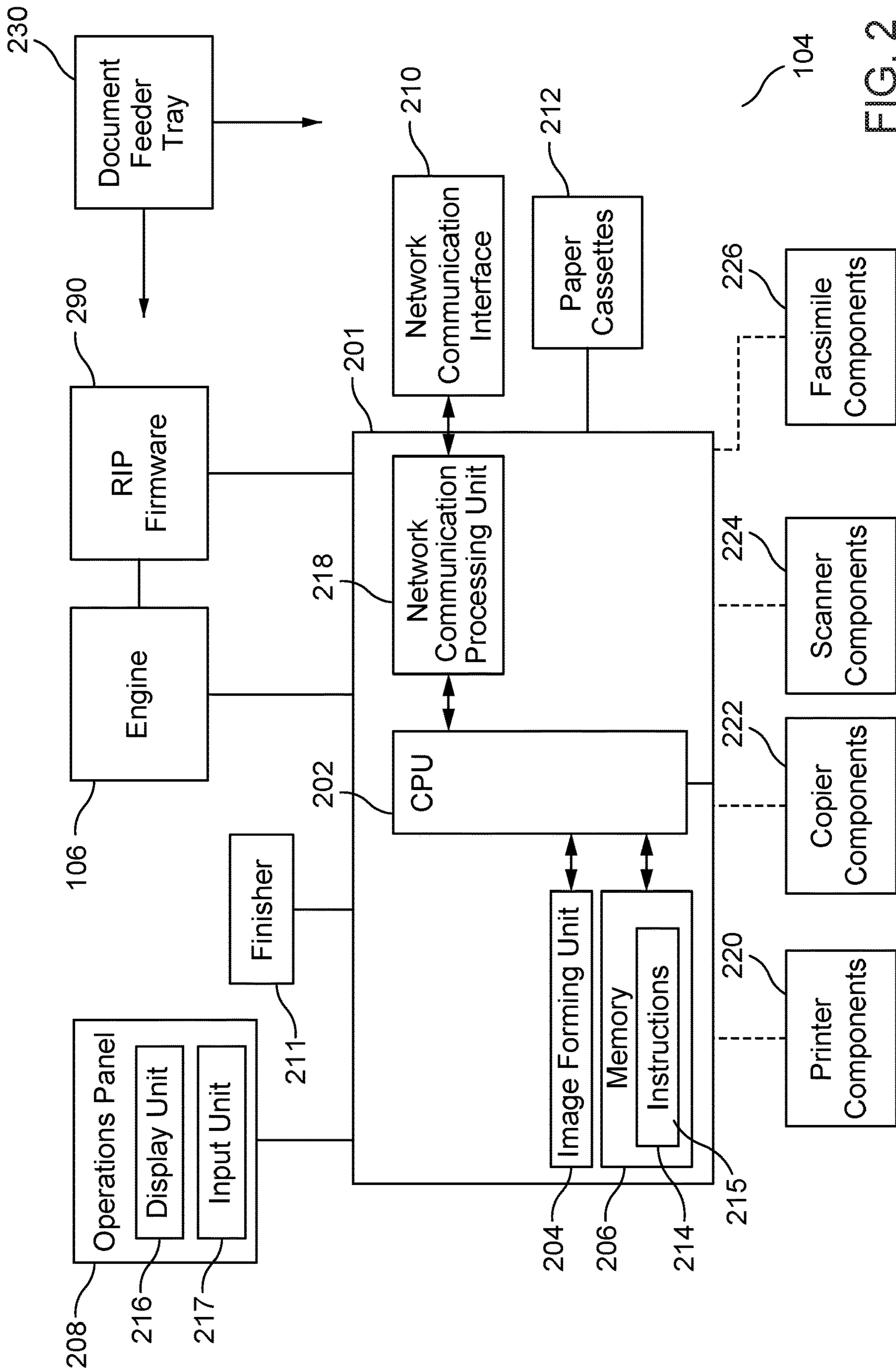


FIG. 2

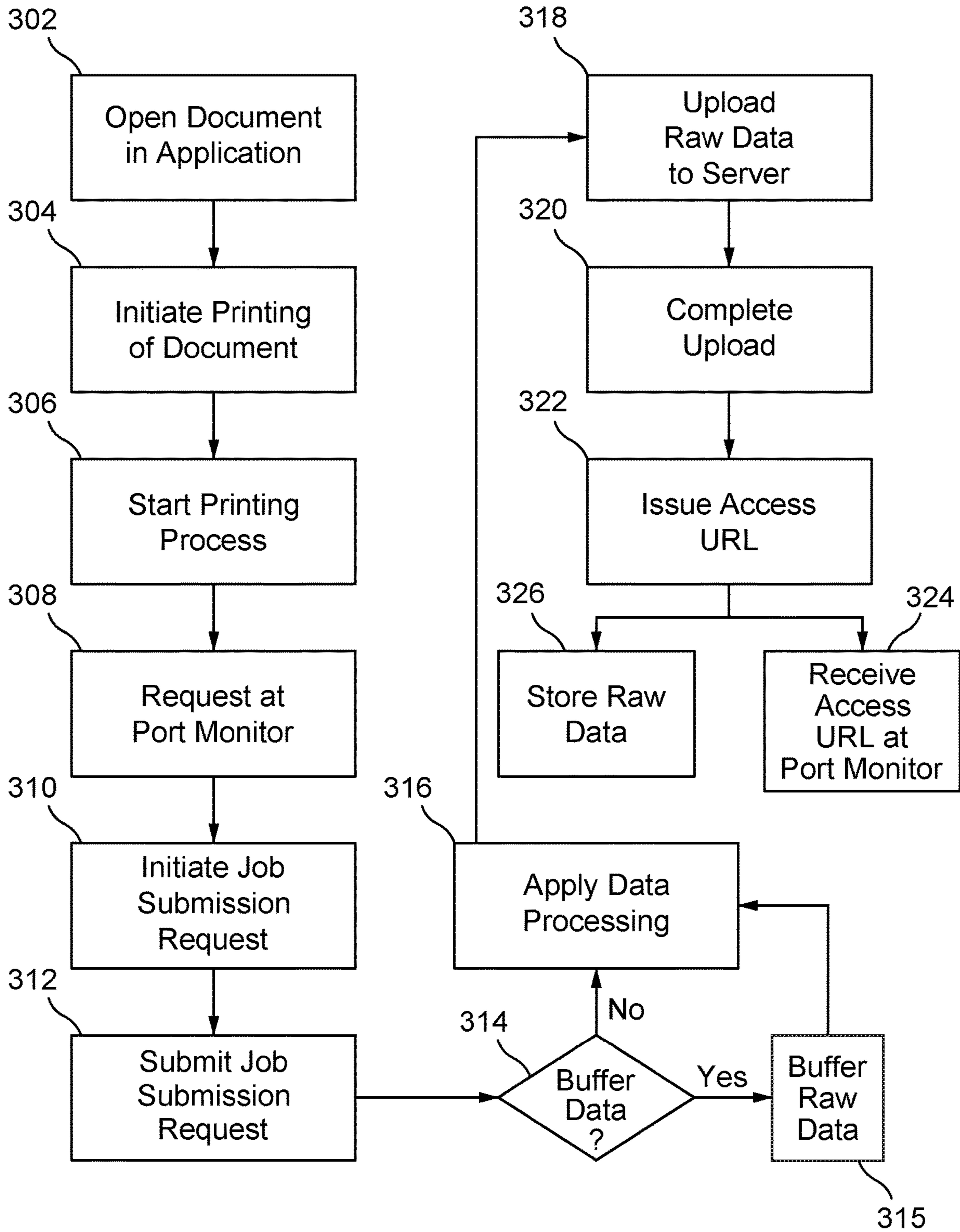


FIG. 3

300

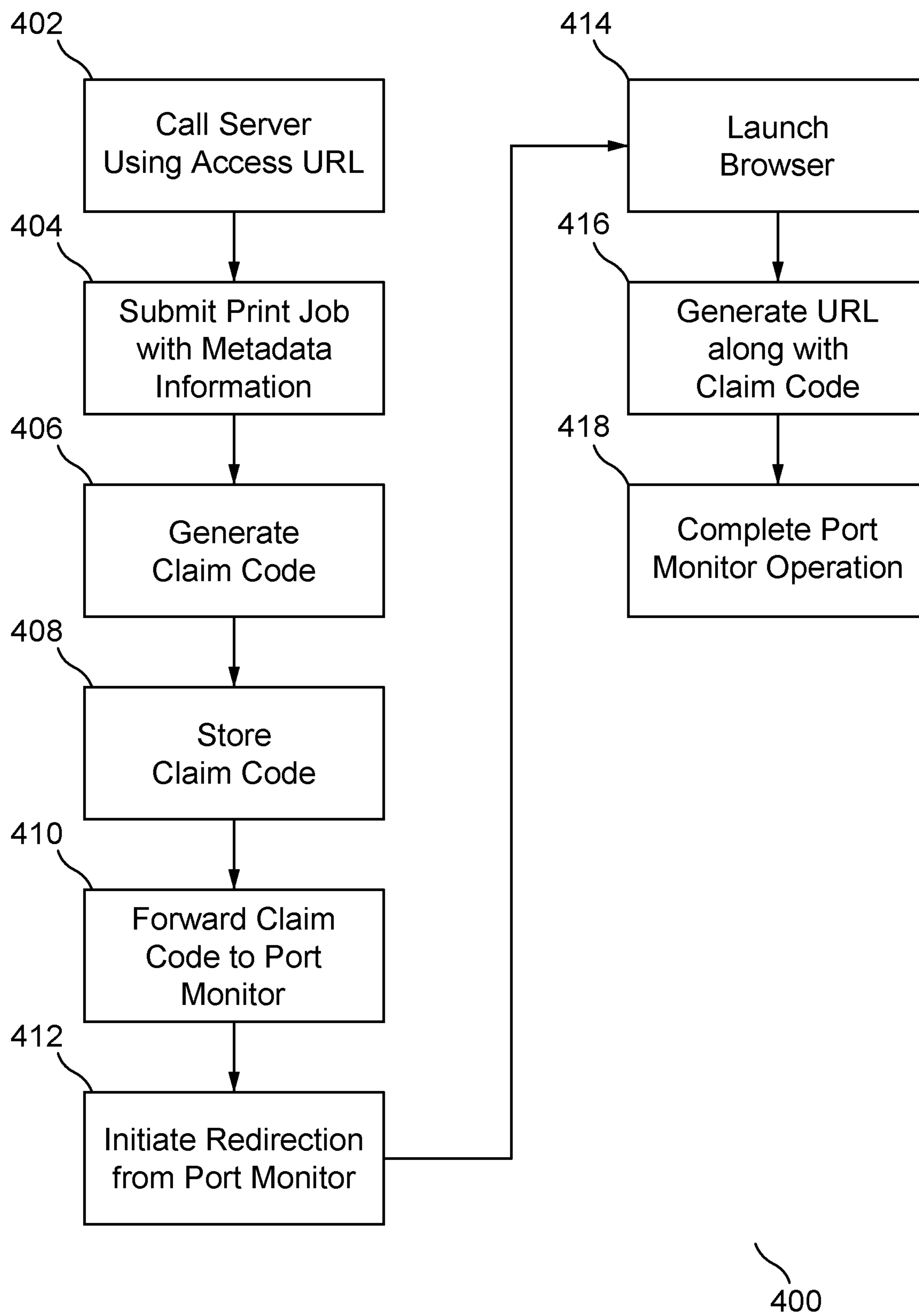


FIG. 4

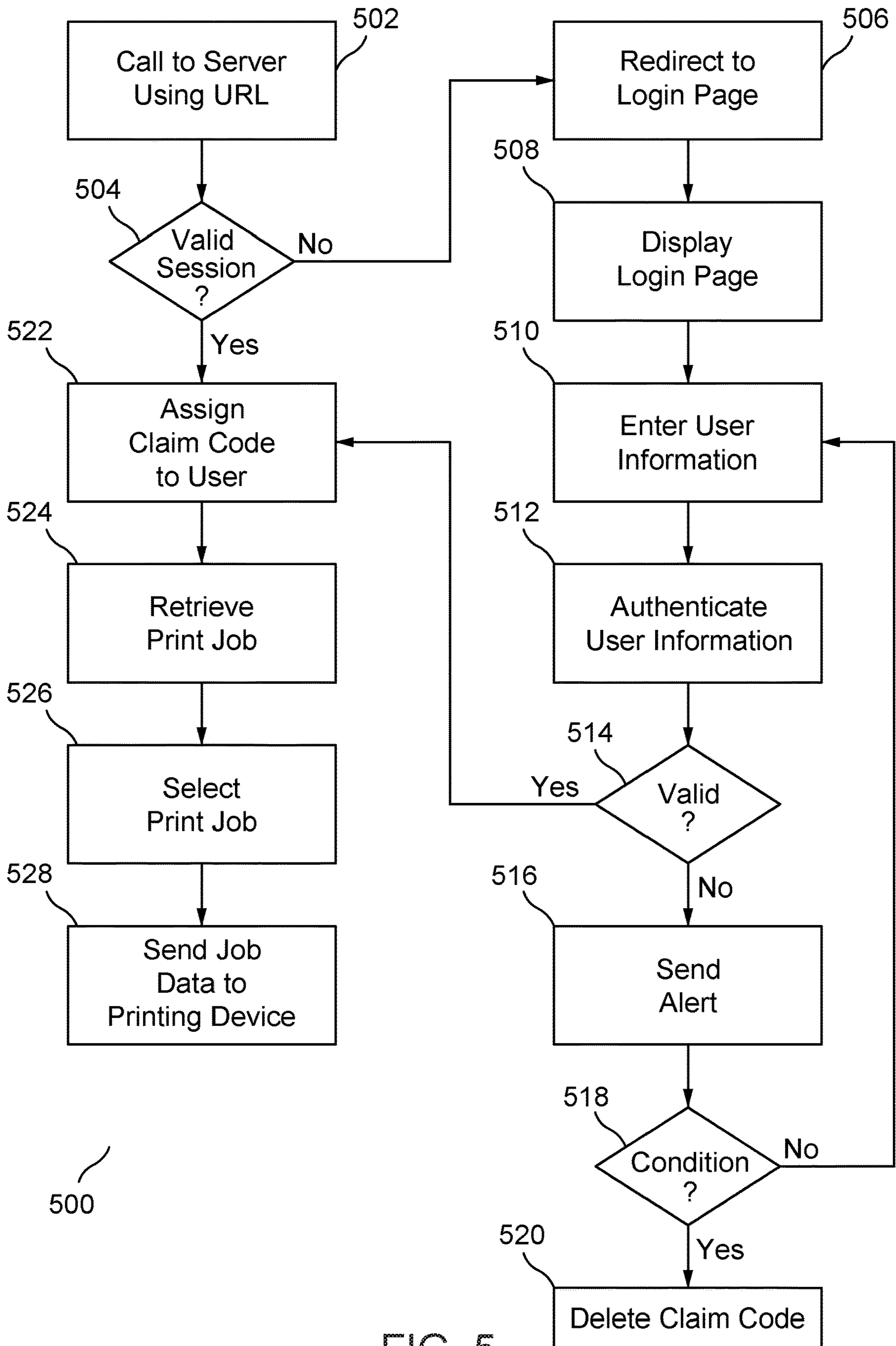


FIG. 5

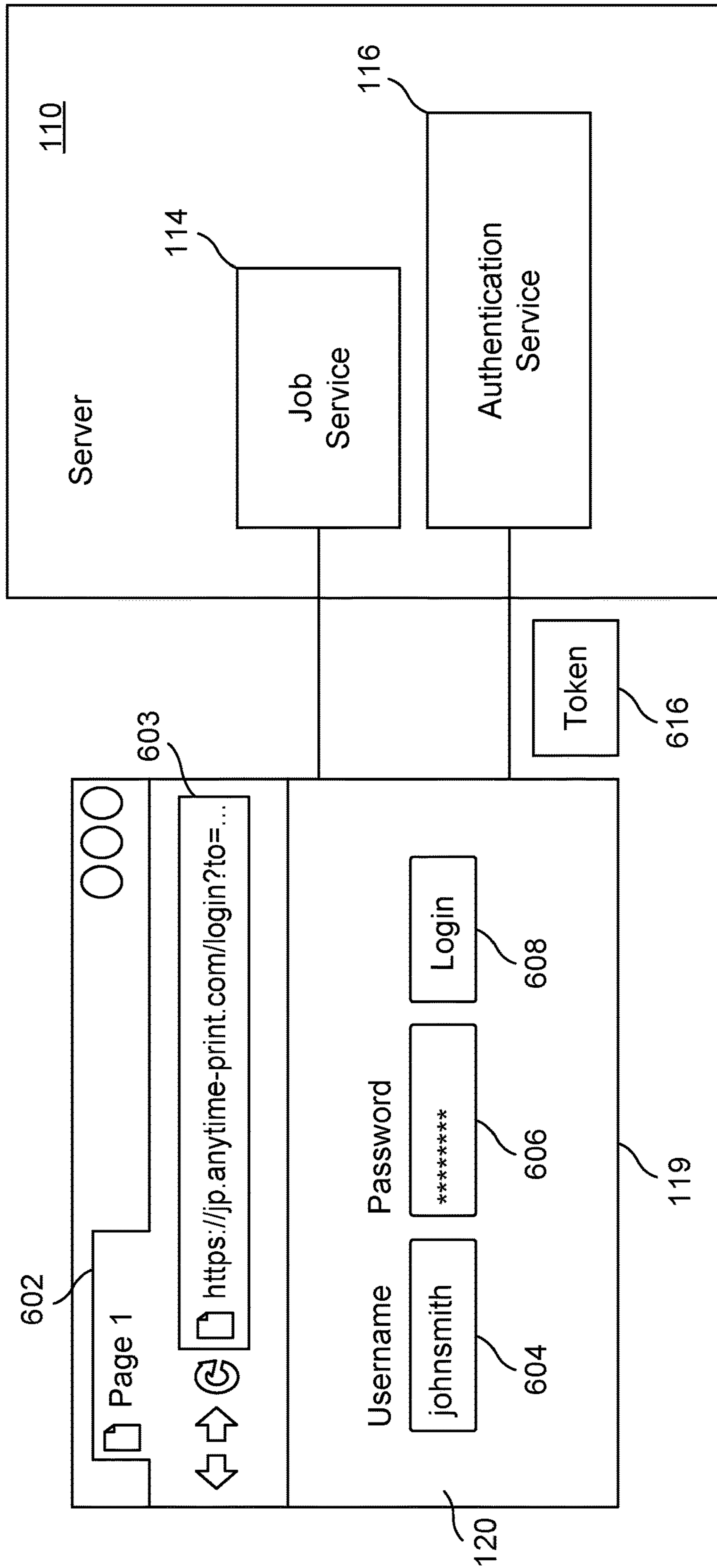


FIG. 6

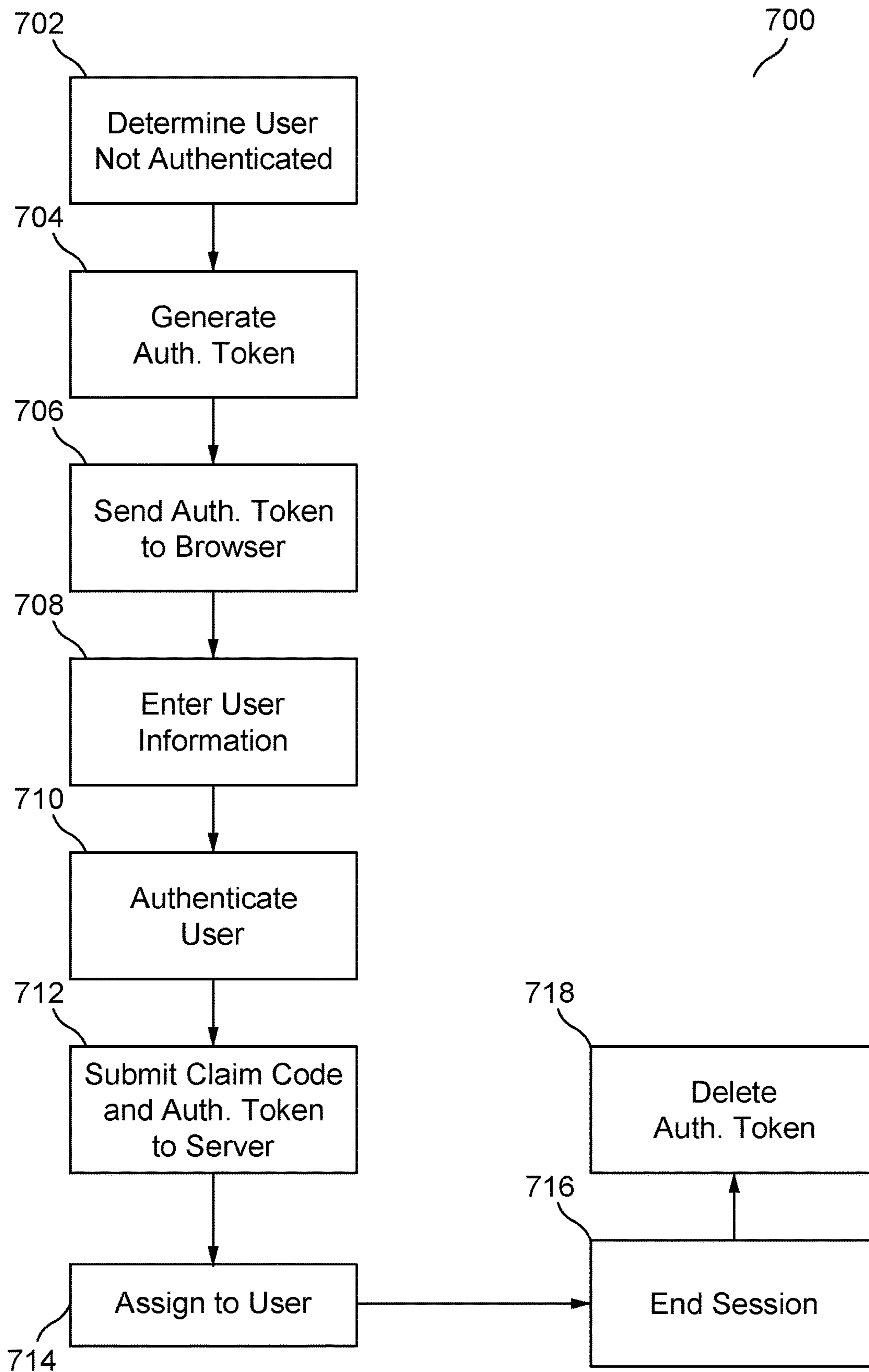


FIG. 7

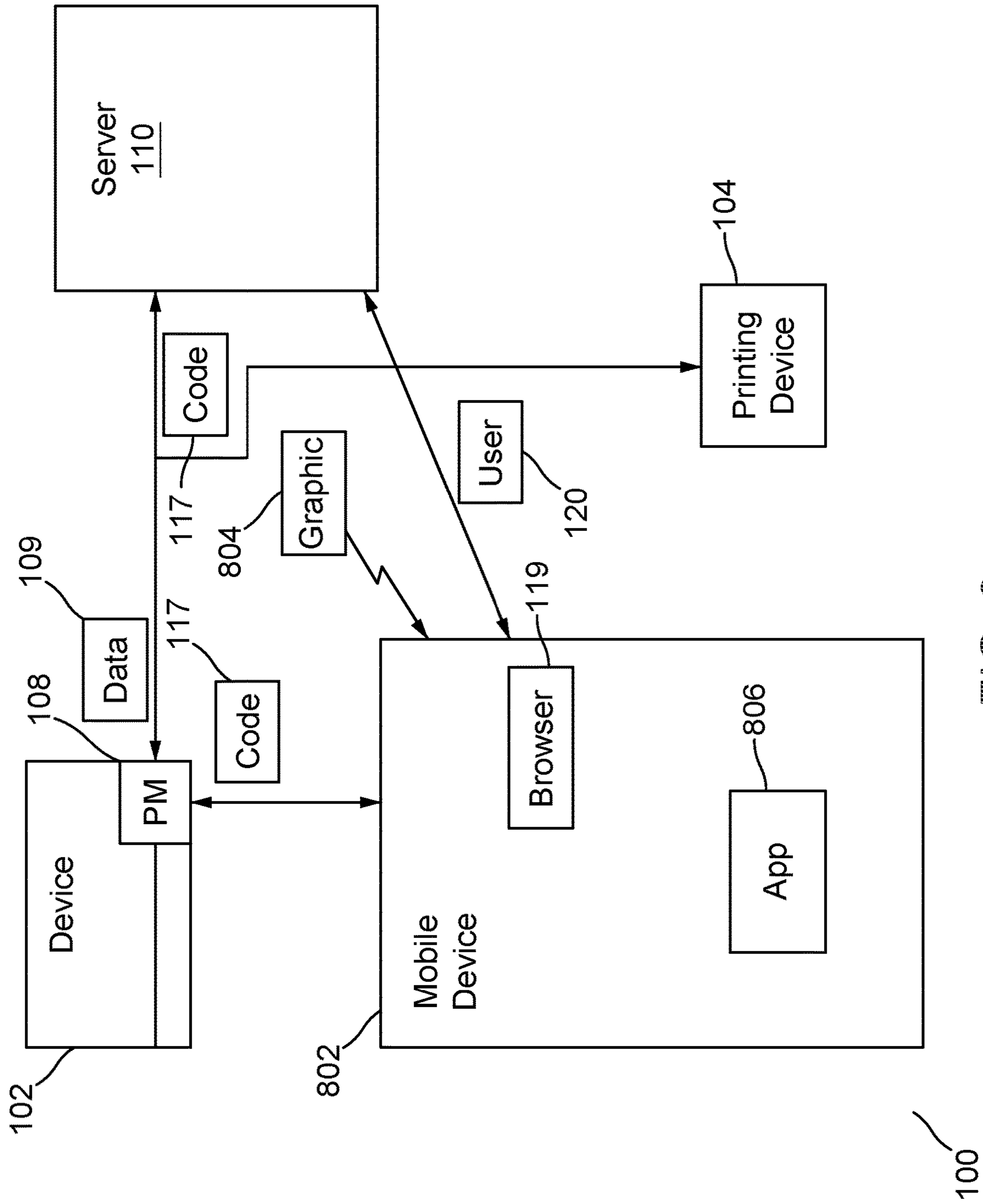


FIG. 8

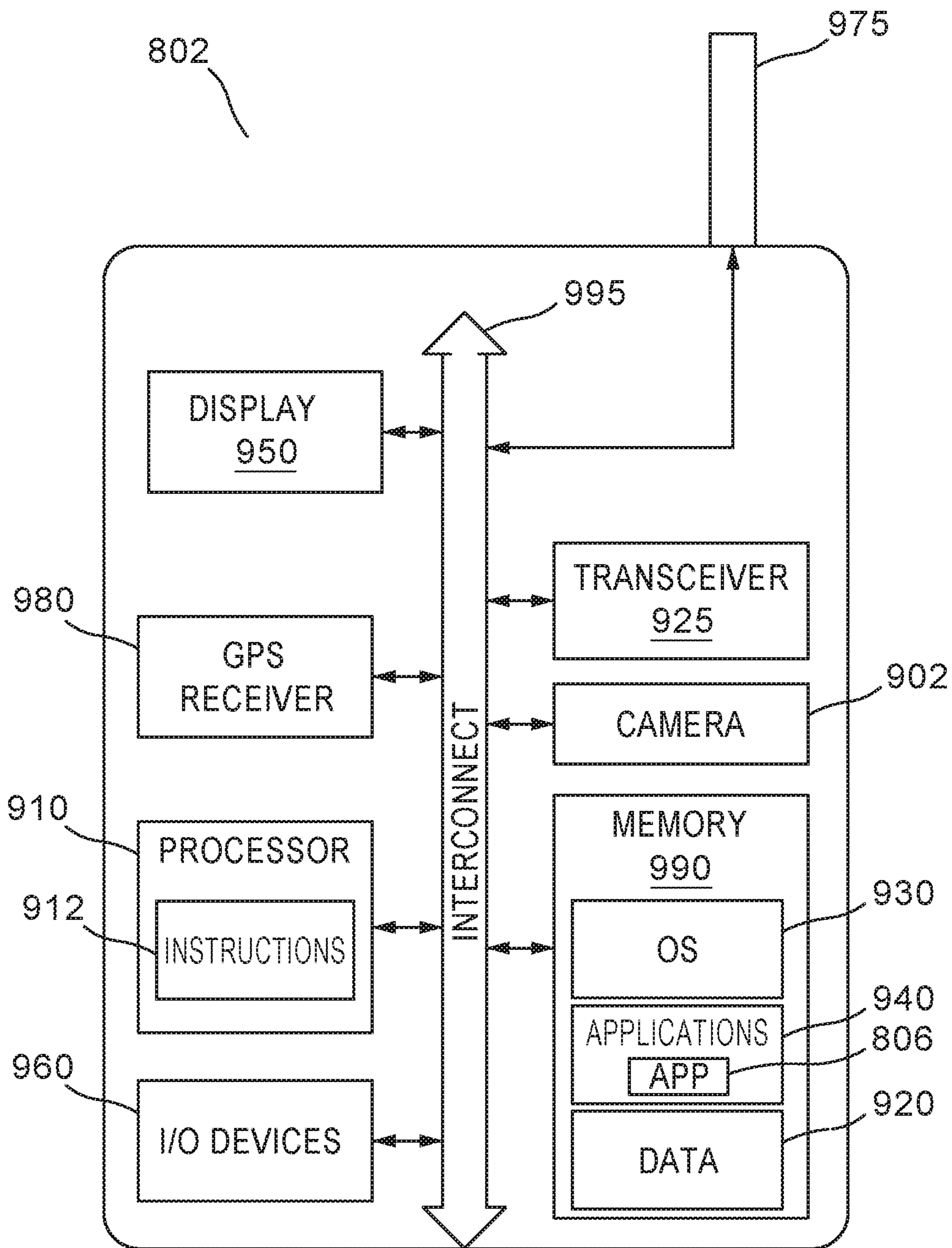


FIG. 9

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AUTHENTICATION FOR PRINTING OPERATIONS FROM A CLOUD-BASED SERVER USING A MOBILE DEVICE

FIELD OF THE INVENTION

The present invention relates to authenticating user access to printing operations from a cloud-based server using a mobile device. More particularly, the present invention relates to authenticating user information to access a job stored on the cloud-based server using the mobile device to provide a claim code.

DESCRIPTION OF THE RELATED ART

A user should be authenticated prior to submitting a print job to a cloud-based server. The authentication determines its permission. It also allows the server to identify the user of a print job, or other processing instruction, being submitted. Authentication usually requires a client program to prompt the user to enter its username and password in a login dialog. Most client applications have no problem prompting a login dialog authenticate a user to a server, then submitting a print job to a cloud-based server. Other client applications, such as a port monitor, may find it difficult to show a login box because the application interferes with the normal printing flow.

SUMMARY OF THE INVENTION

A method for authenticating user access to a print job from a cloud-based server using a mobile device is disclosed. The method includes uploading raw data for the print job to the cloud-based server from a port monitor on a computing device. The method also includes scanning a graphical code by the mobile device. The graphical code directs a browser on the mobile device to the cloud-based server. The method also includes generating a claim code by the cloud-based server. The claim code is assigned to the print job. The method also includes forwarding the claim code to the port monitor. The method also includes launching the browser on the mobile device with a uniform resource locator (URL) address indicating the cloud-based server. The URL address includes the claim code. The method also includes assigning the claim code to a user session to access the print job. The method also includes selecting the print job having the job data associated with the claim code to be sent from the cloud-based server.

A method for authenticating user access to a job at a cloud-based server using a mobile device is disclosed. The method includes uploading raw data for the job from a computing device having a port monitor to the cloud-based server. The method also includes receiving a graphical code at the computing device. The graphical code refers to the uploaded raw data for the job on the cloud-based server. The method also includes scanning the graphical code using the mobile device. The method also includes generating a claim code for the job at the cloud-based server when a call is received based on the scanned graphical code. The method also includes receiving the claim code at an application on the mobile device. The method also includes authenticating a user session to access the job according to the claim code using a uniform resource locator (URL) address in a browser on the mobile device.

A cloud-based printing system is disclosed. The cloud-based printing system includes a cloud-based server to store job data. The cloud-based printing system also includes a

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computing device to upload job data for the job to the cloud-based server using a port monitor. The cloud-based printing system also includes a mobile device connected to the cloud-based server. The mobile device configured to run an application. The cloud-based printing system also includes a printing device to process the job data for the job received from the cloud-based server. The cloud-based server is configured to generate a claim code after the job data is uploaded and to generate a graphical code upon receipt of raw data of the job data from the port monitor. The mobile device is configured to scan the graphical code and to call the cloud-based server using the graphical code. The cloud-based server is configured to provide the claim code to the port monitor to access the job when called by the mobile device.

BRIEF DESCRIPTION OF THE DRAWINGS

Various other features and attendant advantages of the present invention will be more fully appreciated when considered in conjunction with the accompanying drawings.

FIG. 1A illustrates a system to print using a cloud-based server according to the disclosed embodiments.

FIG. 1B illustrates a device having a port monitor to print to the cloud-based server according to the disclosed embodiments.

FIG. 2 illustrates a block diagram of components of the printing device used in conjunction with the authentication system according to the disclosed embodiments.

FIG. 3 illustrates a flowchart for uploading data for a print job to the cloud-based server according to the disclosed embodiments.

FIG. 4 illustrates a flowchart for providing a claim code for the uploaded print job according to the disclosed embodiments.

FIG. 5 illustrates a flowchart for authenticating user to access the print job from the cloud-based server according to the disclosed embodiments.

FIG. 6 illustrates a block diagram of a login page within a browser to authenticate a user according to the disclosed embodiments.

FIG. 7 illustrates a flowchart for authenticating user to access the print job from the cloud-based server using an authentication token according to the disclosed embodiments.

FIG. 8 illustrates a block diagram of the system to print using the cloud-based server with a mobile device according to the disclosed embodiments.

FIG. 9 illustrates a block diagram of the components in the mobile device according to the disclosed embodiments.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference will now be made in detail to specific embodiments of the present invention. Examples of these embodiments are illustrated in the accompanying drawings. Numerous specific details are set forth in order to provide a thorough understanding of the present invention. While the embodiments will be described in conjunction with the drawings, it will be understood that the following description is not intended to limit the present invention to any one embodiment. On the contrary, the following description is intended to cover alternatives, modifications, and equivalents as may be included within the spirit and scope of the

appended claims. Numerous specific details are set forth in order to provide a thorough understanding of the present invention.

A user submits a print job to a cloud-based server, authenticates it, and then claims the print job later for printing or other operations. Once the user submits the print job, a claim code is provided that is not associated with a user. The claim code is presented to claim the print job. Most applications authenticate the user first then do printing operations. The disclosed embodiments do not want to stop printing to wait for authentication. Instead, the printing process continues without interruption. Authentication may be done on a website, which may be difficult for a printing application to do. Printing application does not need a user interface to authenticate.

The disclosed embodiments minimize printing flow interruption by allowing a client application to submit a print job even without prior authentication. This feature works by issuing a claim code to the submitted print job or other printing operation, thereby redirecting the user to a web application to perform post authentication. The job is associated to the authenticated user identified by the claim code. This process is beneficial because it minimizes and simplifies implementation efforts in client programs. The disclosed embodiments also reduce development complexity of the application because authentication is offloaded to a browser. Application does not need updating if authentication protocol via the browser is updated.

The disclosed system and associated methods provide the ability to support possible upload modes. One mode may be a pass-through mode. Another mode may be a buffered mode. It also allows uninterrupted printing flow for a printing application, such as Windows Port Monitor™. A unique claim code is used to identify a submitted print job. A browser is launched to claim a job either by a previously authenticated user or with a new authentication. Unclaimed jobs expire after certain conditions are met along with job data cleanup to avoid orphaned jobs for security and storage consideration purposes. The disclosed processes do not let jobs stay in limbo but may require them to be claimed after a certain point.

Although a print job or a job is discussed herein, the disclosed embodiments may pertain to any type of operations performed on a printing device. These operations include copying, scanning, storing of documents, editing documents, faxing, and the like. The user wishes to send a document, as data, to another device from the cloud-based server and to authenticate the access to that document. The disclosed embodiments may refer to the data for the document as a print job or job.

FIG. 1A depicts a system 100 to print using a cloud-based server 110 according to the disclosed embodiments. FIG. 1B depicts a device 102 having a port monitor 108 to print to the cloud-based server according to the disclosed embodiments. FIG. 1B shows the components that may be utilized for printing within system 100. System 100 may include a network that connects the various components shown. This network may be a wireless or wired network as well as a local area network (LAN) or wide area network (WAN). The various components in system 100 may include internet protocol (IP) addresses that uniquely identify the components within the network so that information may be exchanged. Preferably, any network within system 100 is a secure network. A user should be authenticated before using any component within system 100 or accessing data or information from such component.

System 100 includes device 102 connected to cloud-based server 110 over a network. System 100 also includes printing device 104, which receives print jobs from cloud-based server 110 as well as directly from device 102. System 100 also may include other components to perform printing and scanning operations. System 100 may include a plurality of devices 102 and printing devices 104 that interact with server 110.

Device 102 may be a computing device, such as a computer, mobile tablet, mobile device, laptop, another server, and the like. The features of device 102 are disclosed in greater detail below. Device 102 prints within system 100 using port monitor 108. Port monitor 108 is a printing subsystem that passes raw print job data 109 from spooler 138 to a printing device 104. In some embodiments, port monitor 108 uploads raw print job data 109 to cloud-based server 110.

Cloud-based server 110 preferably is a secure or private server such that one need to be authenticated before accessing data thereon. Alternatively, cloud-based server 110 may be in a private network that prints, when appropriate, to a public network. Cloud-based server 110 keeps print jobs in the private network until the user is authenticated and the print job may be sent to printing device 104. Prior to submitting a print job to cloud-based server 110, a user first must be authenticated to determine its permission to access the server. Server 110 should identify the owner of the print job being submitted. Authentication may require a client program to prompt the user to enter his/her username, password, personal identification number (PIN), or other such private information. The disclosed embodiments provide such processes to authenticate the user without printing flow interruption.

Components on cloud-based server 110 include file service module 112 that receives uploaded raw job data 109 from port monitor 108 over the network. Port monitor 108 may initiate a job submission request to server 110. Port monitor 108 then may upload raw job data 109 to file service module 112. File service module 112 may generate and send a unique access uniform resource locator (URL) address 111 to port monitor 108. URL address 111 is used as a reference to the just uploaded job data.

Cloud-based server 110 also includes job service module 114. Job service module 114 receives a request for print job 113 which also includes job metadata information 115. Job metadata information 115 may include details about the job such as job name, file name, file size, encoding type, content type, document type, timestamps, and the like. Cloud-based server 110 through job service module 114 issues a unique claim code 117 for print job 113 and saves this information in database 118. Claim code 117 also is provided to port monitor 108.

Authentication service module 116 of cloud-based server 110 acts in conjunction with port monitor 108 and internet browser 119 to authenticate the user before sending print job 113 to printing device 104. Port monitor 108 initiates a redirection from device 102 to launch browser 119 by passing along claim code 117 in a URL address 121. Claim code URL address 121 points to cloud-based server 110. Authentication service module 116 interacts with browser to obtain user information 120. Authentication service module 116 assigns claim code 117 to that user presenting user information 120. The user will now see print job 113 in his/her job list, such as displayed on device 102.

The user may instruct that cloud-based server 110 submit print job 113 to printing device 104. Printing device 104 may be a multi-functional printing device in that it may print,

copy, scan, edit, fax, store, and modify a document or documents. Printing device **104** also includes engine **106** that helps complete these functions. Printing device **104** and engine **106** are disclosed in greater detail below.

The processes associated with port monitor **108**, cloud-based server **110**, and printing device **104** are disclosed in greater detail below. Referring to FIG. 1B, a block diagram of device **102** is shown. Device **102** may be a data processing apparatus that includes components that are enabled by a processor **131** executing a program loaded from a memory **129**. Memory **129** may have a location within device **102**. Preferably, memory **129** is a random access memory (RAM) within device **102**. The program may be loaded into memory **129** from another location or device.

Operating system **130** operates on device **102**. Operating system **130** may interact with processor **131** to launch application **132** and enable the components for printing shown in FIG. 1B. Application **132** may be software instructions that are loaded onto processor **131** from memory **129** to convert device **102** into a special purpose machine. Alternatively, application **132** may run on device **102** with other programs. Application **132** may be invoked by the user. In some embodiments, application **132** includes a word processor and an image processing function. Application **132** creates processed data by processing data, which is stored in memory **129** or other memory in response to a user instruction. If the user wants to print the processed data created by the execution of application **132**, then the user may launch a graphical user interface (GUI) using display **146** to display a print wizard or other information capture interface, such as detecting gestures or speech, in order to select a command to print. Other commands may include one to scan or send the processed data to another device or location within system **100**.

Device **102** includes a network interface **142** and an input/output (I/O) interface **144**. Network interface **142** receives data based on a TCP/IP protocol or the like through the network of system **100**. Network interface **142** also outputs print data or processed data processed by device **102** through the network of system **100**. Network interface **142** may use input connection **142i** and output connection **142o** to communicate over system **100**.

I/O interface **144** receives an input from an inputting device, such as a keyboard, touch screen, heads up display, motion or speech detector, mouse, and the like. I/O interface **144** may send data and instructions such as an event notification to application **132**. I/O interface **144** may cause display **146** to display a result of execution of application **132** via a graphics driver or the like in order to provide the GUI to capture instructions and commands from the user. I/O interface **144** may use input connection **144i** and output connection **144o** to perform these functions.

When a print or scan command is issued, an instance of a format converting part is generated. The print data is created with a format acceptable to a printing device, such as printing device **104**. The print data also may be compatible with specifications set forth by cloud-based server **110** or system **100**. The format converting part of device **102** may include drawing component **134** and print processor **140**. For example, the format converting part may contain a graphics display interface (GDI). If the user issues a print command of the processed data through application **132**, then the format converting part calls drawing component **134** to create an instance of a drawing component contained in the processed data.

Drawing component **134** may send a format specific to an application such as image metadata to print processor **140** in

order to change the format into a specific format including raster data, which may be used by printing device **104**. In some embodiments, the data structure may be registered as a data structure for registering a data value associated with drawing data and a data structure for registering a data value for an external transmission.

In some embodiments, text contained in the processed data is sent to printer driver **136** together with the setting of the font and other information. Printer driver **136** performs processing such as setting of a text character, setting of a line interval and a character interval, setting of margins, setting of a text arrangement area and the like in order to create a format specific to printing device **104**. Printer driver **136** may generate print data in order to further control printing device **104** by describing the page description language (PDL) or printer job language (PJM) in the page description language describing area with respect to image data and the text during and after the disclosed processing.

In order to generate the print data of a format specific to printing device **104**, printer driver **136** sends the created print data to spooler **138** so that the spooler transfer the data being processed to the format converting part through print processor **140**. The data is output from device **102** via spooler **138** and port monitor **108** after completion of creation of the print data, as shown by job raw data **109**.

Port monitor **108** sends out the print data, or raw data **109**, in accordance with an output destination. Port monitor **108** acquires, from the described data structure, output destination information such as an IP address or a host name of another device within system **100**, such as printing device **104** or cloud-based server **110**. Raw print data **109** is sent to this location through network interface **142**. In some embodiments, port monitor **108** may use buffer **141** to store the processed data until it is ready to be uploaded over system **100**. Port monitor **108** also may request printing or other operations on printing device **104**.

In summary, the disclosed embodiments, application **132** is invoked by the user to create or edit a document or other file. In turn, data is created and processed for the document. If the user instructs printing of the data, then printer driver **136** receives a specific unit of data from application **132**. The data is used for the requested print job. Printer driver **136** sequentially generates a PDL image for every specific unit of data. The generated PDL image is passed to spooler **138**. Port monitor **108** sequentially receives the print job, which may be the PDL image, from spooler **138**. Port monitor **108** sets up a port in which to transfer job raw data **109** for the print job to a component on system **100**.

FIG. 2 illustrates a block diagram of components of printing device **104** used in conjunction with system **100** according to the disclosed embodiments. The architecture shown in FIG. 2 may apply to any multi-functional printer or image forming apparatus that scans documents to perform other functions, such as printing, storing, copying, and the like. As disclosed above, printing device **104** may send and receive data from device **102** through port monitor **108** or cloud-based server **110**.

Printing device **104** includes a computing platform **201** that performs operations to support these functions. Computing platform **201** includes a computer processing unit (CPU) **202**, an image forming unit **204**, a memory unit **206**, and a network communication interface **210**. Other components may be included but are not shown for brevity. Printing device **104**, using computing platform **201**, may be configured to perform various operations, such as scanning, copying, printing, receiving or sending a facsimile, or document processing. As such, printing **104** may be a printing

device or a multi-function peripheral including a scanner, and one or more functions of a copier, a facsimile device, and a printer. To provide these functions, printing device **104** includes printer components **220** to perform printing operations, copier components **222** to perform copying operations, scanner components **224** to perform scanning operations, and facsimile components **226** to receive and send facsimile documents. CPU **202** may issue instructions to these components to perform the desired operations.

Printing device **104** also includes a finisher **211** and one or more paper cassettes **212**. Finisher **211** includes rotatable downstream rollers to move papers with an image formed surface after the desired operation to a tray. Finisher **211** also may perform additional actions, such as sorting the finished papers, binding sheets of papers with staples, doubling, creasing, punching holes, folding, and the like. Paper cassettes **212** supply paper to image the various components **220**, **222**, **224**, and **226** to create the image formed surfaces on the papers. Paper cassettes **212** may include papers having various sizes, colors, composition, and the like. Paper cassettes **212** may be removed to refill as needed.

Document processor input feeder tray **230** may be the physical components of printing device **104** to receive papers and documents to be processed. A document is placed on or in document processor input feeder tray **230**, which moves the document to other components within printing device **104**. The movement of the document from document processor input feeder tray **230** may be controlled by the instructions input by the user. For example, the document may move to a scanner flatbed for scanning operations. Thus, document processor input feeder tray **230** provides the document to scanner components **220**. As shown in FIG. 2, document processor input feeder tray **230** may interact with engine firmware **106** to perform the desired operations.

Memory unit **206** includes memory storage locations **214** to store instructions **215**. Instructions **215** are executable on CPU **202** or other processors associated with printing device **104**, such as any processors within components **220**, **222**, **224**, or **226**. Memory unit **206** also may store information for various programs and applications, as well as data specific to printing device **104**. For example, a storage location **214** may include data for running an operating system executed by computing platform **201** to support the components within printing device **104**. According to the disclosed embodiments, memory unit **206** may store the tokens and codes used in performing the authentication operations for printing device **104**.

Memory unit **206** may comprise volatile and non-volatile memory. Volatile memory may include random access memory (RAM). Examples of non-volatile memory may include read-only memory (ROM), flash memory, electrically erasable programmable read-only memory (EEPROM), digital tape, a hard disk drive (HDD), or a solid-state drive (SSD). Memory unit **206** also includes any combination of readable or writable volatile memories or non-volatile memories, along with other possible memory devices.

Computing platform **201** may host one or more processors, such as CPU **202**. These processors are capable of executing instructions **215** stored at one or more storage locations **214**. By executing these instructions, the processors cause printing device **104** to perform various operations. The processors also may incorporate processing units for specific purposes, such as application-specific integrated circuits (ASICs) and field programmable gate arrays (FPGAs). Other processors may be included for executing operations particular to components **220**, **222**, **224**, and **226**.

In other words, the particular processors may cause printing device **104** to act as a printer, copier, scanner, and a facsimile device.

Printing device **104** also includes an operations panel **208**, which may be connected to computing platform **201**. Operations panel **208** may include a display unit **216** and an input unit **217** for facilitating interaction with a user to provide commands to printing device **104**. Display unit **216** may be any electronic video display, such as a liquid crystal display (LCD). Input unit **217** may include any combination of devices that allow users to input information into operations panel **208**, such as buttons, a touch screen, a keyboard or keypad, switches, dials, and the like. Preferably, input unit **217** includes a touch-screen digitizer overlaid onto display unit **216** that senses touch to receive inputs from the user. By this manner, the user interacts with display unit **216**.

Printing device **104** also includes network communication processing unit **218**. Network communication processing unit **218** may establish a network communication, such as a wireless or wired connection with one or more other image forming apparatuses and a server in an image forming system. CPU **202** may instruct network communication processing unit **218** to transmit or retrieve information over a network using network communication interface **210**. As data is received at computing platform **201** over a network, network communication processing unit **218** decodes the incoming packets and delivers them to CPU **202**. CPU **202** may act accordingly by causing operations to occur on printing device **104**. CPU **202** also may retrieve information stored in memory unit **206**, such as settings for printing device **104**.

Printing device **104** also includes engine **106**. Engine **106** may be a combination of hardware, firmware, or software components that act accordingly to accomplish a task. For example, engine **106** is comprised of the components and software to print a document. It may receive instructions from computing platform **201** after user input via operations panel **208**. Alternatively, engine **106** may receive instructions from other attached or linked devices.

Engine **106** manages and operates the low-level mechanism of the printing device engine, such as hardware components that actuate placement of toner onto paper. Engine **106** may manage and coordinate the half-toner, toner cartridges, rollers, schedulers, storage, input/output operations, and the like. Raster image processor (RIP) firmware **290** that interprets the page description languages (PDLs) may transmit and send instructions down to the lower-level engine **106** for actual rendering of an image and application of the toner onto paper during operations on printing device **104**.

FIG. 3 depicts a flowchart **300** for uploading data for a print job **113** to cloud-based server **110** according to the disclosed embodiments. The disclosure of flowchart **300** may refer to elements of FIGS. 1A, 1B, and 2 in disclosing the features of FIG. 3. Flowchart **300**, however, is not limited to the embodiments disclosed by FIGS. 1A, 1B, and 2.

Step **302** executes by opening or creating a document in application **132** on device **102**. As disclosed above, data may be generated, modified, or processed within the document. For example, a user may enter text or images into the document. Application **132** may be a word processing application, spreadsheet, and the like. Step **304** executes by initiating printing or other operations of the document from device **102**. The user may initiate printing by entering commands or by selecting options from a menu. Step **306** executes by starting the printing process within device **102**.

As disclosed above, printer driver 136, spooler 138, and other components generate the data for the print job of the document.

Step 308 executes by receiving the print request at port monitor 108. Port monitor 108 may perform any necessary internal processing including identifying a destination for the print job for the document. In some embodiments, the print operations may be completed using cloud-based server 110. The print job, as print job 113, may be stored on cloud-based server 110 and then forwarded to printing device 104. Alternatively, port monitor 108 may identify printing device 104 to receive the print job.

Step 310 executes by initiating a job submission request from port monitor 108. Step 312 executes by submitting the job submission request to cloud-based server 110. Port monitor 108 may initiate and submit the job submission request to server 110 by calling its application program interfaces (APIs) to interface with the server.

Step 314 executes by determining whether the raw data from port monitor 108 is to be buffered. In some embodiments, the data for the entire print job is collected before upload to cloud-based server 110. If yes, then step 315 executes by buffering raw data 109 in buffer 141 as it comes from port monitor 108. Port monitor 108 may be instructed to enter a buffered mode that collects the data in buffer 141. Flowchart 300 then proceeds to step 316, disclosed below.

If step 314 is no, then flowchart 300 proceeds directly to step 316. If the buffered mode is not used, then a pass-through mode is used so that raw data 109 are directly uploaded to cloud-based server 110 using a streaming or chunk-by-chunk method. Before being uploaded, step 316 executes by applying data processing to raw data 109 before it leaves network interface 142. Data processing operations include compression, encryption, encoding, signing, and the like that are applied to the data. In some embodiments, step 316 may be optional in that raw data 109 is streamed directly from network interface 142 without any processing.

Step 318 executes by uploading raw data 109 to cloud-based server 110. The data are uploaded using file service module 112. File service module 112 receives raw data 109 within cloud-based server 110. In some embodiments, file service module 112 may buffer the received data until the upload is complete. It also may apply data processing operations on the received data to decode, decrypt, and the like.

Step 320 executes by completing the upload operations for raw data 109. An indication that the data transfer is complete may be received at file service module 112. Step 322 executes by issuing an access URL address 111. Access URL address 111 may be a unique access URL address to reference the raw data just uploaded from device 102. Access URL address 111 also may be known as the upload URL address. Step 324 executes by receiving access URL address 111 at port monitor 108. Port monitor 108 may keep access URL address 111 until print job 113 is ready to be submitted to cloud-based server 110. Step 326 executes by storing uploaded raw data 109. In some embodiments, file service module 112 may store the raw data on database 118.

FIG. 4 depicts a flowchart 400 for providing a claim code for the uploaded print job according to the disclosed embodiments. The disclosure of flowchart 400 may refer to elements of FIGS. 1A, 1B, and 2 in disclosing the features of FIG. 4. Flowchart 400, however, is not limited to the embodiments disclosed by FIGS. 1A, 1B, and 2.

Step 402 executes by calling cloud-based server 110 using access URL address 111. Port monitor 108 may call another cloud-based printing system API using access URL address

111. Access URL address 111 directs the communication interface to job service module 114. Step 404 executes by submitting print job 113 to job service module 114 along with job metadata information 115. Port monitor 108 submits job metadata information 115 to complete print job 113. Metadata information 115 may include details about the print job, or document, such as job name, file name, file size, encoding type, content type, document type, timestamps, and the like. When associated with raw data 109, the data and information for print job 113 is captured at cloud-based server 110. Job service module 114 may use the unique URL address of access URL address 111 to identify the raw data uploaded for the print job.

Step 406 executes by generating claim code 117 for print job 113. Claim code 117 is a unique claim code associated with print job 113. It identifies print job 113 from a plurality of print jobs stored on cloud-based server 110. Claim code 117 may be in a variety of forms, including a random string, an integer form, a universally unique identifier, and the like. In some embodiments, information provided by port monitor 108, such as metadata information 115, may be used to generate claim code 117. Step 408 executes by storing claim code 117 in database 118. Job service module 114 may configure claim code 117 to identify print job 113 within database 118.

Step 410 executes by forwarding claim code 117 to port monitor 108 using the communication interface between the port monitor and job service module 114. Thus, claim code 117 is provided to port monitor 108 as well as kept by cloud-based server 110. Step 412 executes by initiating a redirection from port monitor 108 from cloud-based server 110 to a browser 119. Browser 119 may be located on device 102 and displayed on display 146. Alternatively, browser 119 may be located on another device, such as an application on a mobile device. Port monitor 108 may send a command to the application to enable browser 119.

Step 414 executes by launching browser 119. Step 416 executes by generating a claim code URL address 121 that includes claim code 117. Port monitor 108 passes along claim code 117 that is embedded or placed into claim code URL address 121. Claim code URL address 121 points to cloud-based server 110. Thus, the claim code URL address directs a call to job service module 114 to set up the communication interface over system 100.

For example, the URL address to cloud-based server 110 may be <https://jp.anytime-print.com/jobclaims>. The claim code may be aeb59781-89a3-4bd9-9361-4059aabe82d5. Thus, the claim code URL address may be <https://jp.anytime-print.com/jobclaims/aeb59781-89a3-4bd9-9361-4059aabe82d5>. Port monitor 108 delivers claim code 117 with the URL to cloud-based server 110. Step 418 executes by completing operations at port monitor 108. Port monitor 108 is not needed for further operations to authenticate the user to access print job 113. It now may commence additional printing operations for device 102. Cloud-based server 110 may release any resources associated with communicating with port monitor 108.

FIG. 5 depicts a flowchart 500 for authenticating user to access the print job from the cloud-based server according to the disclosed embodiments. The disclosure of flowchart 500 may refer to elements of FIGS. 1A, 1B, 2, and 6 in disclosing the features of FIG. 5. Flowchart 500, however, is not limited to the embodiments disclosed by FIGS. 1A, 1B, 2, and 6.

Step 502 executes by calling to cloud-based server 110 using claim code URL address 121 from browser 119. As disclosed in FIG. 4, claim code URL address 121 includes

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claim code 117. Step 504 executes by determining whether a valid and authentication user session already exists. If yes, then flowchart 500 proceeds to step 522, disclosed below. If step 504 is no, then step 506 executes by redirecting browser 119 to a login page. Browser 119 also calls to authentication service module 116 to initiate the authentication process for the user.

Step 508 executes by displaying the login page to authenticate a user for a session to access print job 113 from cloud-based server 110. An example of a login page 602 within browser 119 may be disclosed by FIG. 6. FIG. 6 depicts a block diagram of a login page 602 within a browser 119 to authenticate a user according to the disclosed embodiments. Information entered into browser 119 may be sent to cloud-based server 110. Job service module 114 may pass control of the authentication process to authentication service module 116 at this point. The URL address for the login page, or URL address 603, may differ from the previous URL addresses used to upload the print job and present claim code 117 to cloud-based server 110.

Step 510 executes by entering user information 120 for the user onto login page 602. For example, username field 604 may receive the username and password field 606 may receive a password associated with the username. Button 608 instructs browser 119 to send the user information to authentication service module 116. Step 512 executes by authenticating user information 120 with the credentials for the user stored on cloud-based server 110. Alternatively, authentication service module 116 may confirm user information 120 with credentials located on another device in system 100.

Step 514 executes by determining whether user information 120 is valid. If no, then step 516 executes by sending an alert to the user. The alert may be sent to port monitor 108. Browser 119 may redirect the user back to login page 602. Further, claim code 117 is not claimed for print job 113 by the user. Thus, it stays stored on server 110. After a condition is met, claim code 117 may not be valid. Step 518 executes by determining whether a condition to delete claim code 117 is met. A condition may include a predetermined period of time stored on server 110, a number of unsuccessful attempts to authenticate the user, and the like. If yes, step 520 executes by deleting claim code 117 along with related database entries and files from database 118. This data may be deleted for security and storage allocation purposes. Cloud-based server 110 does not want limited resources devoted to unclaimed print jobs. If step 518 is no, then flowchart 500 proceeds back to step 510.

If step 514 is yes, then the user is validated and successfully authenticated. Flowchart 500 proceeds to step 522. Step 522 executes by assigning claim code 117 to the user. Claim code 117 may be assigned to the user session between the user and cloud-based server 110. As disclosed above, if a valid user session already exists when claim code 117 is provided by claim code URL address 121, then the claim code is assigned to that session so that the user does not need to re-enter user information 120. Browser 119 may not be redirected to login page 602.

Step 524 executes by retrieving print job 113 on cloud-based server 110. After successful association of claim code 117 to the user, the user will see the print job in his/her job list for print jobs stored on the server. The job list may be displayed in browser 119. Step 526 executes by selecting print job 113 from the job list. Step 528 executes by sending the data for print job 113, including raw data 109, to printing device 104. In some embodiments, cloud-based server 110 sends print job 113 to printing device 104 such that appli-

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cation 132 is not involved in the printing process after port monitor 108 is done. Application 132 and port monitor 108 may be released to perform other operations, including those not involving server 110 or printing device 104.

FIG. 7 depicts a flowchart 700 for authenticating user to access the print job from the cloud-based server using an authentication token 616 according to the disclosed embodiments. Authentication token 616 may be used with claim code 117 to initiate access by the user to the print jobs stored on cloud-based server 110. Properties associated with the data within authentication token 616 is disclosed below. The disclosure of flowchart 700 may refer to elements of FIGS. 1A, 1B, 2, and 6 in disclosing the features of FIG. 7. Flowchart 700, however, is not limited to the embodiments disclosed by FIGS. 1A, 1B, 2, and 6. Flowchart 700 also may execute in conjunction with flowchart 500 disclosed above.

Step 702 executes by determining that the user is not authenticated after receiving claim code 117 using claim code URL address 121, as disclosed above. As disclosed by flowchart 500, if a valid and authenticated user session exists, then authentication processes may not be executed. One way to determine whether such a user session exists is to determine whether an authentication token 616 is associated with the session. Authentication token 616 may indicate that the user information is received and confirmed at cloud-based server 110.

Step 704 executes by generating authentication token 616 in order to authenticate the user retrieving print job 113. Authentication token 616 may be a string of data associated with the user or this session to authenticate the user. Cloud-based server 110 generates authentication token 616. For example, authentication service module 116 may generate authentication token 616 when browser 119 is redirected to login page 602.

Step 706 executes by sending authentication token 616 to browser 119. Browser 119 already has claim code 117, as provided by port monitor 108. Step 708 executes by entering user information 120 using login page 602, as disclosed above. Step 710 executes by authenticating the user with user information 120. In some embodiments, cloud-based server may generate authentication token 616 after user information 120 is validated.

Step 712 executes by submitting claim code 117 and authentication token 616 to cloud-based server 110. Browser 119 may submit these items along with user information 120. In other embodiments, browser 119 may submit these items when requested by cloud-based server 110. Step 714 executes by assigning claim code 117 to the user. Further, authentication token 616 may be assigned to the session between the user and the server. The user may print to printing device 104 from cloud-based server 110 during the session.

Step 716 executes by ending the session. Step 718 executes by deleting authentication token 616 from cloud-based server 110 and, if applicable, from browser 119. To initiate a new session to access a print job, the user will need to login again using the disclosed embodiments. Thus, a new authentication token will be generated at that time. A determination may be made to delete authentication token 616 depending on the content of the token. Further, deletion of authentication tokens may depend on the architecture of system 100 and cloud-based server 110. In some embodiments, authentication token 616 may not be stored on cloud-based server 100 and, therefore, will not need to be deleted.

If tokens are stored on cloud-based server 110, then step 718 may need to be executed. If authentication token 616 is a random string, then it should be stored in database 118 of cloud-based server 110. When a request comes with authentication token 616, cloud-based server 110 makes a database lookup to see if such a token exists. Cloud-based server 110 may determine properties within authentication token 616, such as expiry or expiration date/time, ownership, when submitted, and the like. Cloud-based server 110 may make the database read for every client call. This approach may not be suitable for systems having multiple independent servers, such as in a distributed system.

In some embodiments, authentication token 616 is encrypted and contains important properties that become readable when decrypted. One of the token properties may be the expiry timestamp. In these embodiments, cloud-based server 110 only need to decrypt authentication token 616 to check its validity. No database read by cloud-based server 110 is needed. This approach may be faster than the one using a stored authentication token 616 in database 118. Authentication token 616 becomes invalid when it expires, such as within an hour or less. Thus, step 712 may execute by determining whether authentication token 616 expired when it is received by cloud-based server 110.

FIG. 8 depicts a block diagram of system 100 to print using cloud-based server 110 with a mobile device 802 according to the disclosed embodiments. The components disclosed in FIG. 8 may be incorporated into system 100 shown in FIG. 1A. Some components are not shown of system 100 for brevity. In some embodiments, mobile device 802 may be used to interact with device 102, cloud-based server 110, and printing device 104. Authentication operations may occur on browser 119, which is located on mobile device 802. Alternatively, authentication operations may occur on mobile application 806, which executes on mobile device 102.

The disclosed embodiments may execute the processes to authenticate the user to allow access to an uploaded print job at cloud-based server 110 but utilize mobile device 802 to perform the authentication processes. Mobile device 802 may include browser 119 that captures user information 120 to authenticate the user during a printing process. Port monitor 108 forwards claim code 117 received from cloud-based server 110 to use in browser 119 to provide the claim code to the cloud-based server. These embodiments, however, differ from the embodiments using device 102.

Port monitor 108 may upload raw data 109 to cloud-based server 110, as disclosed above. After the upload, port monitor 108 may receive graphical code 804 instead of access URL address 111. Graphical code 804 may be a bar code, a quick response (QR) code, a matrix code, identification numbers, and the like. Graphical code 804 directs mobile device 802 to cloud-based server 110 to generate claim code 117. Mobile device 802 may scan graphical code 804, which directs it to cloud-based server 110 to identify uploaded print job 113. Graphical code 804 may be scanned from device 102 after receipt at port monitor 108.

Alternatively, graphical code 804 may be displayed on printing device 104. The user may be at printing device 104 to receive the print job. Graphical code 804 is displayed to begin authentication operations on mobile device 802. Thus, the printing process may be executed until this point at which the process is halted until the user scan graphical code 804.

Mobile application 802 may use the information in graphical code 804 displayed on printing device 104 to call cloud-based server 110, much like port monitor 108 may do

with access URL address 111. Unlike device 102, printing device 104 may be in a public place. One does not want graphical code 804 available for scanning by users not allowed to access the print job. Mobile application 806, therefore, may need to present authentication token 616 or other form of verification that the user is allowed to claim graphical code 804. In other words, graphical code 804 will not be displayed until the user through mobile device 802 presents a token or enters a separate code to display graphical code 804.

Mobile application 806 may execute on mobile device 802 to receive captured graphical code 804. Mobile application 806 also may provide interfaces between print jobs on cloud-based server 110 and the user. The print jobs may be displayed within an interface after authentication of the user. Mobile application 806 also may work with browser 119 to capture user information 120 to send to cloud-based server 110 for authentication of the user. In some embodiments, mobile application 806 may be launched instead of browser 119. Mobile application 806 may receive claim code 806 and present it to cloud-based server 110. Mobile application 806 also may receive user information 120 to authenticate the user and allow access to the print job at cloud-based server 110. Mobile application 806 also may act as a scanning application to capture images, such as graphical code 804.

Once cloud-based server 110 receives the call from mobile device 802 using graphical code 804, the server generates claim code 117. As disclosed above, cloud-based server 110 sends claim code 117 to port monitor 108. Port monitor 108 may perform the processes disclosed above to provide claim code 117 in claim code URL address 121 using browser 119. In some embodiments, port monitor 108 may forward claim code 117 to mobile device 802. Browser 119 is launched on mobile device 802 and claim code 117 embedded into claim code URL address 121 as disclosed above. The user may then click claim code URL address 121 to submit claim code 117 to cloud-based server 110.

One purpose of using mobile device 802 to provide claim code 117 may be to use the mobile device to authenticate the user. Login page 602 may appear in browser 119 on mobile device 802. The user may enter user information 120 on mobile device 802 as opposed to going back to device 102. If the user is at printing device 104, then this feature allows the user to access print jobs on cloud-based server 110 on mobile device 802 without interruption of the printing process. The user may select print job 113 associated with claim code 117 to send to printing device 104 or do other processing operations. For example, the user may use mobile device 802 to send print job 113 back to device 102 for additional processing using application 132.

Graphical code 804 may include information that corresponds to access URL address 111. The information may be converted by mobile application 806 to fill browser 119 with URL address 111. Graphical code 804 may be generated by cloud-based server 110 and also includes information about print job 113 uploaded to the server from port monitor 108. At this point, raw data 109 may be the uploaded data. Other data may be provided that is incorporated into graphical code 804. Mobile device 804 also may receive graphical code via text, messaging application, email, and the like.

In some embodiments, authentication token 616 may be received at mobile device 802 for the authentication process. Thus, mobile device 802 forwards authentication token 616 along with claim code 117 to cloud-based server 110 to gain access to print job 113. Authentication token 616 also may reside on mobile device 802 until the user session is terminated or it expires. Mobile application 806 also may keep

authentication token **616** so that the user does not need to input user information **120** for every access to cloud-based server **110**. For example, mobile application **806** may save authentication token **616** for thirty (30) days, when the token expires as disclosed above. The user may submit authentication token **616** with the scanned graphical code. In other embodiments, mobile application **806** may support fingerprint or retina scanning to identify and authenticate the user. Mobile application **806** indicates to cloud-based server **110** that the user is allowed to access the print job associated with claim code **117**.

FIG. **9** depicts a block diagram of the components in mobile device **802** according to the disclosed embodiments. Mobile device **802** executes mobile application **806** to enable authentication operations between cloud-based server **110**. Mobile device **802** may include a processor **910**. Processor **910** may be any of a variety of different types of processors suitable for mobile devices. Processor **910** executes instructions **912**. Instructions **912** may be loaded into processor **910** in order to configure mobile device **802** to perform specified functions or operations. These instructions may come from applications **940** stored in memory **990**, or may be partially or wholly hardwired as part of processor **910**.

Memory **990**, such as random access memory (RAM), a flash memory, or other type of memory, is accessible by processor **910**. In some embodiments, memory **990** may be partially comprised of read-only memory (ROM). Memory **990** may be configured to store an operating system (OS) **930**, data **920**, and applications **940**. Applications **940** include client agents, mobile applications, and mobile location-enabled applications that may provide location-based services to the user. Data **920** may include data received from the other entities in system **100**, such as printing device **104**, computing device **102**, and cloud-based server **110**.

Processor **910** may be coupled, either directly or via appropriate intermediary hardware, to a display **950** and to one or more input/output (I/O) devices **960**, such as a keypad, a touch panel sensor, a microphone, and the like. Processor **910** also may be coupled to transceiver **925** that interfaces with an antenna **975** to send and receive data within system **100**. Transceiver **925** may be configured to transmit and receive cellular network signals, wireless data signals, or other types of signals via antenna **975**. Mobile device **802** may be configured by an application **940** to receive and transmit specific types of signals. Mobile device **802** also may include a port or connection through I/O devices **960** to communicate with a device connected by a wire or other physical connection. In some embodiments, a global positioning system (GPS) receiver **380** also may make use of antenna **975** to receive GPS signals.

Mobile device **802** also includes camera **902**. Camera **902** may capture images for use by applications **940**. Specifically, camera **902** may act as a scanner to capture graphical codes **804** for use by mobile application **802**. The appropriate application within applications **940** may control camera **902**.

Each of camera **902**, display **950**, transceiver **925**, GPS receiver **380**, processor **910**, memory **990**, I/O devices **960**, and antenna **975** may be connected to interconnect **995**. Alternatively, the components of mobile device **802** may be connected directly or indirectly to one or more of each other. Interconnect **995** may be one or more mobile device communications systems such as a bus or other hardware to enable communication between the components of mobile device **802**.

Applications **940** include mobile application **806** to enable authentication processes to access the print job at cloud-based server **110**. The following disclosure will focus on the interaction between mobile application **806** and port monitor **108**, though the same principles may be applied to any application or service within system **100**. Mobile device **802** receives data and information from device **102**. It may do so using port monitor **108**. Mobile device **802** also may receive instructions from port monitor **108**.

In some embodiments, port monitor **108** may be located on mobile device **802**. Application **132** and other components disclosed above also may be located on mobile device **802**. In other words, device **102** is mobile device **802**. Mobile device **802** may authenticate the user to access the uploaded print job on cloud-based server **110** as disclosed above.

The disclosed embodiments include processes to submit a print job to a cloud-based server, authenticate the user for accessing the print job, and claim the print job later for printing or other operations. The claim code issued in the processes claims the print job and is not associated with the user upon generation. Most applications authenticate the user then perform print processing. Printing operations are stopped to wait for authentication. A port monitor may not be able to authenticate and stops printing operations. The disclosed embodiments avoid such delay and inefficient use of printing resources by letting the printing process proceed without interruption.

Authentication may be done on a website associated with the cloud-based server. Authentication is not done on the port monitor. Further, the port monitor does not need a user interface to authenticate the user. It is done elsewhere, such as a browser, application, GUI on a mobile device, and the like.

As will be appreciated by one skilled in the art, the present invention may be embodied as a system, method or computer program product. Accordingly, the present invention may take the form of an entirely hardware embodiment, an entirely software embodiment (including firmware, resident software, micro-code, etc.) or an embodiment combining software and hardware aspects that may all generally be referred to herein as a "circuit," "module" or "system." Furthermore, the present invention may take the form of a computer program product embodied in any tangible medium of expression having computer-usable program code embodied in the medium.

Any combination of one or more computer usable or computer readable medium(s) may be utilized. The computer-usable or computer-readable medium may be, for example but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, device, or propagation medium. More specific examples (a non-exhaustive list) of the computer-readable medium would include the following: an electrical connection having one or more wires, a portable computer diskette, a hard disk, a random access memory (RAM), a read-only memory (ROM), an erasable programmable read-only memory (EPROM or Flash memory), an optical fiber, a portable compact disc read-only memory (CD-ROM), an optical storage device, a transmission media such as those supporting the Internet or an intranet, or a magnetic storage device. Note that the computer-usable or computer-readable medium could even be paper or another suitable medium upon which the program is printed, as the program can be electronically captured, via, for instance, optical scanning of the paper or other medium, then compiled, interpreted, or

otherwise processed in a suitable manner, if necessary, and then stored in a computer memory.

Computer program code for carrying out operations of the present invention may be written in any combination of one or more programming languages, including an object oriented programming language such as Java, Smalltalk, C++ or the like and conventional procedural programming languages, such as the "C" programming language or similar programming languages. The program code may execute entirely on the user's computer, partly on the user's computer, as a stand-alone software package, partly on the user's computer and partly on a remote computer or entirely on the remote computer or server. In the latter scenario, the remote computer may be connected to the user's computer through any type of network, including a local area network (LAN) or a wide area network (WAN), or the connection may be made to an external computer (for example, through the Internet using an Internet Service Provider).

The present invention is described with reference to flowchart illustrations and/or block diagrams of methods, apparatus (systems) and computer program products according to embodiments of the invention. It will be understood that each block of the flowchart illustrations and/or block diagrams, and combinations of blocks in the flowchart illustrations and/or block diagrams, can be implemented by computer program instructions. These computer program instructions may be provided to a processor of a general purpose computer, special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions, which execute via the processor of the computer or other programmable data processing apparatus, create means for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks.

The flowchart and block diagrams in the figures illustrate the architecture, functionality, and operation of possible implementations of systems, methods and computer program products according to various embodiments of the present invention. In this regard, each block in the flowchart or block diagrams may represent a module, segment, or portion of code, which comprises one or more executable instructions for implementing the specified logical function (s). It should also be noted that, in some alternative implementations, the functions noted in the block may occur out of the order noted in the figures. For example, two blocks shown in succession may, in fact, be executed substantially concurrently, or the blocks may sometimes be executed in the reverse order, depending upon the functionality involved. It will also be noted that each block of the block diagrams and/or flowchart illustration, and combinations of blocks in the block diagrams and/or flowchart illustration, can be implemented by special purpose hardware-based systems that perform the specified functions or acts, or combinations of special purpose hardware and computer instructions.

The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the invention. As used herein, the singular forms "a," "an" and "the" are intended to include plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specific the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

Embodiments may be implemented as a computer process, a computing system or as an article of manufacture such as a computer program product of computer readable media. The computer program product may be a computer storage medium readable by a computer system and encoding a computer program instructions for executing a computer process. When accessed, the instructions cause a processor to enable other components to perform the functions disclosed above.

The corresponding structures, material, acts, and equivalents of all means or steps plus function elements in the claims below are intended to include any structure, material or act for performing the function in combination with other claimed elements are specifically claimed. The description of the present invention has been presented for purposes of illustration and description, but is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill without departing from the scope and spirit of the invention. The embodiment was chosen and described in order to best explain the principles of the invention and the practical application, and to enable others of ordinary skill in the art to understand the invention for embodiments with various modifications as are suited to the particular use contemplated.

One or more portions of the disclosed networks or systems may be distributed across one or more multi-functional printing (MFP) systems coupled to a network capable of exchanging information and data. Various functions and components of the MFP system may be distributed across multiple client computer platforms, or configured to perform tasks as part of a distributed system. These components may be executable, intermediate or interpreted code that communicates over the network using a protocol. The components may have specified addresses or other designators to identify the components within the network.

It will be apparent to those skilled in the art that various modifications to the disclosed may be made without departing from the spirit or scope of the invention. Thus, it is intended that the present invention covers the modifications and variations disclosed above provided that these changes come within the scope of the claims and their equivalents.

What is claimed is:

1. A method for authenticating user access to a print job from a cloud-based server using a mobile device, the method comprising:

- uploading raw data for the print job to the cloud-based server from a port monitor on a computing device;
- receiving a graphical code at a printing device or the computing device from the cloud-based server;
- scanning a graphical code by the mobile device, wherein the graphical code directs a browser on the mobile device to the cloud-based server;
- calling the cloud-based server from the mobile device using the graphical code;
- submitting job metadata information for the print job to the cloud-based server;
- generating a claim code by the cloud-based server using the job metadata information, wherein the claim code is assigned to the print job;
- forwarding the claim code to the port monitor;
- launching the browser on the mobile device with a uniform resource locator (URL) address indicating the cloud-based server, wherein the URL address includes the claim code;
- assigning the claim code to a user session to access the print job; and

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selecting the print job having job data associated with the claim code to be sent from the cloud-based server.

2. The method of claim 1, further comprising initiating a redirection from the port monitor to launch the browser.

3. The method of claim 1, wherein the uploading includes streaming the raw data for the print job to the cloud-based server.

4. The method of claim 1, wherein the uploading includes buffering the raw data for the print job and uploading the buffered raw data to the cloud-based server.

5. The method of claim 1, wherein the uploading includes buffering the raw data for the print job at the cloud-based server.

6. A method for authenticating user access to a job at a cloud-based server using a mobile device, the method comprising:

uploading raw data for the job from a computing device having a port monitor to the cloud-based server;

receiving a graphical code at the computing device, wherein the graphical code refers to the uploaded raw data for the job on the cloud-based server;

scanning the graphical code using the mobile device;

calling the cloud-based server from the mobile device using the graphical code;

submitting job metadata information for the print job to the cloud-based server;

generating a claim code for the job at the cloud-based server using the job metadata information when a call is received based on the scanned graphical code;

receiving the claim code at an application on the mobile device; and

authenticating a user session to access the job according to the claim code using a uniform resource locator (URL) address in a browser on the mobile device.

7. The method of claim 6, further comprising storing the claim code at the cloud-based server.

8. The method of claim 7, further comprising deleting the claim code from the cloud-based server according to a condition.

9. The method of claim 6, wherein the uploading includes uploading the raw data directly to the cloud-based server from the computing device.

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10. The method of claim 6, wherein the uploading includes buffering the raw data before uploading to the cloud-based server.

11. The method of claim 6, wherein the graphical code corresponds to an access uniform resource locator (URL) address for the cloud-based server.

12. A cloud-based printing system comprising:

a cloud-based server to store job data;

a computing device to upload job data for a job to the cloud-based server using a port monitor;

a mobile device connected to the cloud-based server, the mobile device configured to run an application; and a printing device to process the job data for the job received from the cloud-based server,

wherein the cloud-based server is configured

to generate a graphical code upon receipt of raw data of the job data from the port monitor, and

to send the graphical code to the computing device or the printing device,

wherein the mobile device is configured

to scan the graphical code,

to call the cloud-based server using the graphical code, and

to submit job metadata information for the job to the cloud-based server, and

wherein the cloud-based server is configured

to generate a claim code using the job metadata information, wherein the claim code is assigned to the job and

to provide the claim code to the port monitor to access the job when called by the mobile device.

13. The cloud-based printing system of claim 12, wherein the computing device or the printing device is configured to display the graphical code.

14. The cloud-based printing system of claim 12, wherein the application is configured to launch a browser having the claim code with a uniform resource locator (URL) address.

15. The cloud-based printing system of claim 12, wherein the cloud-based server is located in a private network.

16. The cloud-based printing system of claim 15, wherein the computing device is a scanner.

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